CLAIMS

What is claimed is:

1. A device for electric field control in a field emission display comprising:

a cathode substrate;

a plurality of emitter lines formed on the cathode substrate; and

a plurality of gate wires crossing over the plurality of emitter lines, each gate wire having a cross section shaped to produce an electric field between adjacent gate wires that is substantially uniform and substantially flat across a portion of an emitter line in between the adjacent gate wires, the electric field causing an electron emission from the portion of the emitter line.

2. The display of claim 1 wherein the cross section of each gate wire is shaped to produce the electric field which causes the electron emission that is substantially straight from the portion of the emitter line.

3. The display of claim 1 wherein the cross section of each gate wire is shaped to focus the electron emission from the portion of the emitter line.

4. The display of claim 1 wherein the cross section of each gate wire is shaped to have a geometry with at least a portion of an upper left section and an upper right section of the geometry removed.

5. The display of claim 4 wherein the at least the portion comprises a notch removed from the upper left section and the upper right section.

6. The display of claim 4 wherein the cross section is shaped in a generally rectangular geometry.

7. The display of claim 6 wherein the generally rectangular geometry has four upper quadrants and four lower quadrants, an upper left quadrant and an upper right quadrant removed from the generally rectangular geometry.

8. The display of claim 1 further comprising a gate frame coupled to the cathode substrate, the plurality of gate wires spanning from one side of the gate frame to an opposite side of the gate frame.

9. The display of claim 1 wherein the electric field is produced by applying a voltage potential difference between at least one gate wire and the emitter line, the electric field sufficient to cause the electron emission from the portion of the emitter line.

10. The display of claim 1 wherein the plurality of gate wires are discrete components manufactured separately from the cathode substrate and the emitter lines.

11. A field emission display comprising:

a cathode substrate including a plurality of emitter lines formed on the cathode substrate;

a plurality of gate wires positioned over the cathode substrate; and

an anode plate including a plurality of phosphor lines positioned over the plurality of gate wires, the plurality of phosphor lines aligned with the plurality of emitter lines.

12. The display of claim 11 wherein each gate wire has a cross section shaped to produce an electric field between adjacent gate wires that is substantially uniform and substantially flat across a portion of an emitter line in between the adjacent gate wires, the electric field causing an electron emission from the portion of the emitter line.

13. The display of claim 12 wherein the cross section of each gate wire is shaped to produce the electric field which causes the electron emission that is substantially straight from the portion of the emitter line.

14. The display of claim 12 wherein the cross section of each gate wire is shaped to focus the electron emission from the portion of the emitter line.

15. The display of claim 12 wherein the cross section of each gate wire is shaped to have a geometry with at least a portion of an upper left section and an upper right section of the geometry removed.

16. The display of claim 15 wherein the at least the portion comprises a notch removed from the upper left section and the upper right section.

17. The display of claim 15 wherein the cross section is shaped in a generally rectangular geometry.

18. The display of claim 17 wherein the generally rectangular geometry has four upper quadrants and four lower quadrants, an upper left quadrant and an upper right quadrant removed from the generally rectangular geometry.

19. The display of claim 11 further comprising a gate frame coupled to the cathode substrate, the plurality of gate wires spanning from one side of the gate frame to an opposite side of the gate frame.

20. The display of claim 11 wherein the electric field is produced by applying a voltage potential difference between at least one gate wire and an emitter line, the electric field sufficient to cause the electron emission from a portion of the emitter line in between adjacent gate wires.

21. The display of claim 11 wherein the plurality of gate wires are discrete components manufactured separately from the cathode substrate, the plurality of emitter lines and the anode plate.

22. A device for use in a field emission display comprising:

a cathode substrate having emitter lines; and

a gate wire crossing over the emitter lines, wherein the gate wire has a cross section shaped to produce an electric field between the gate wire and an adjacent gate wire that is substantially uniform and substantially flat across a portion of an emitter line.

23. The device of claim 22 wherein the cross section is shaped to have a geometry with at least a portion of an upper left section and an upper right section of the geometry removed.

24. The device of claim 23 wherein the at least a portion comprises a notch removed from the upper left section and the upper right section.

25. The device of claim 23 wherein the cross section is shaped in a generally rectangular geometry.

26. The device of claim 25 wherein the generally rectangular geometry has four upper quadrants and four lower quadrants, an upper left quadrant and an upper right quadrant removed from the generally rectangular geometry.

27. The device of claim 22 wherein the cross section of the gate wire is shaped to produce the electric field which causes an electron emission that is substantially straight from the portion of the emitter line.

28. The device of claim 22 wherein the cross section of the gate wire is shaped to focus an electron emission from the portion of the emitter line.

29. The device of claim 22 wherein the electric field is produced by applying a voltage potential difference between the gate wire and the emitter line, the electric field sufficient to cause an electron emission from at least the portion of the emitter line.

30. A gate device for use in a field emission display comprising:

a wire adapted to cross over emitter lines of a cathode substrate;

the wire having a length adapted to extend across at least a portion of the cathode substrate;

the wire having a cross section adapted to produce an electric field between the wire and an adjacent wire that is substantially uniform and substantially flat across a portion of an emitter line upon the application of a voltage potential between the wire and the adjacent wire and the emitter line.

31. The device of claim 30 wherein the cross section is adapted to produce the electric field which causes an electron emission that is

substantially straight from the portion of the emitter line.

32. The device of claim 30 wherein the cross section is adapted to focus an electron emission from the portion of the emitter line.

33. The device of claim 30 wherein the cross section is shaped to have a geometry with at least a portion of an upper left section and an upper right section of the geometry removed.

34. The device of claim 33 wherein the at least the portion comprises a notch removed from the upper left section and the upper right section.

35. The device of claim 33 wherein the cross section is shaped in a generally rectangular geometry.

36. The device of claim 35 wherein the generally rectangular geometry has four upper quadrants and four lower quadrants, an upper left quadrant and an upper right quadrant removed from the generally rectangular geometry.

37. The device of claim 30 wherein opposite portions of the gate wire are adapted to be coupled to opposite sides of a gate frame coupled to the cathode substrate.

38. The device of claim 30 wherein the gate wire is a discrete component manufactured separately from the cathode substrate and the emitter line.